

CLAIMS

We claim:

1. A semiconductor laser with a semiconductor body, including a laser resonator, comprising:

a plurality of discontinuities formed in a first region of said semiconductor body and arranged such that radiation generated by the semiconductor laser cannot propagate therethrough, and

a second region of said semiconductor body constituting the laser resonator, said second region having none of said discontinuities formed therein, to enable propagation therethrough of radiation generated by the semiconductor laser.

2. The semiconductor laser as claimed in claim 1, wherein
the resonator (3) has an angled or curved resonator axis.

3. The semiconductor laser as claimed in claim 1, wherein
the discontinuities are filled with a filling material, the refractive index of which differs from the refractive index of the semiconductor body (1).

4. The semiconductor laser as claimed in claim 1, wherein

the semiconductor regions adjoin a filling material, the refractive index of which differs from the refractive index of the semiconductor regions.

5. An optically pumped semiconductor device with a vertical emitter (13) comprising a quantum well structure (7),

wherein

the quantum well structure (7) of the vertical emitter (13) is optically pumped by at least one semiconductor laser as claimed in claim 1.

6. An optically pumped semiconductor device with a vertical emitter (13) comprising a quantum well structure (7) wherein

the quantum well structure (7) of the vertical emitter (13) is pumped by a plurality of semiconductor lasers (16a to 16m) as claimed in claim 1, at least one of said semiconductor lasers having a resonator with an angled or curved resonator axis.

7. An optically pumped semiconductor device with a vertical emitter (13) comprising a quantum well structure (7), and with a pump radiation source (20), which generates radiation (21) for optically pumping the quantum well structure (7), comprising:

a waveguide for coupling the pump radiation (21) into the quantum well structure (7), wherein said waveguide is laterally delimited at least partly by a plurality of discontinuities arranged in such a way that the pump radiation is not capable of propagating within said arrangement.

8. The optically pumped semiconductor device as claimed in claim 7, wherein
the discontinuities are filled with a filling material, the refractive index of which differs
from the refractive index of the semiconductor body.
9. The optically pumped semiconductor device as claimed in claim 7, wherein
the semiconductor regions adjoin a filling material, the refractive index of which differs
from the refractive index of the semiconductor regions.
10. The optically pumped semiconductor device as claimed in claim 7, wherein
the pump radiation source is a semiconductor laser with a semiconductor body, including
a laser resonator, comprising:
a plurality of discontinuities formed in a first region of said semiconductor body and
arranged such that radiation generated by the semiconductor laser cannot propagate therethrough,
and
a second region of said semiconductor body constituting the laser resonator, said second
region having none of said discontinuities formed therein, to enable propagation therethrough of
radiation generated by the semiconductor laser.
11. The optically pumped semiconductor device as claimed in claim 5, wherein
the vertical emitter (13) and the semiconductor laser are grown epitaxially on a common
substrate (8).

12. The optically pumped semiconductor device as claimed in claim 7, wherein the pump radiation source (20) is grown epitaxially on a common substrate (8).
13. The optically pumped semiconductor device as claimed in claim 7, wherein said discontinuities comprise a periodic arrangement of cutouts.
14. The optically pumped semiconductor device as claimed in claim 7, wherein said discontinuities comprise a periodic arrangement of semiconductor regions.
15. The semiconductor laser as claimed in claim 1, wherein said discontinuities comprise a periodic arrangement of cutouts.
16. The semiconductor laser as claimed in claim 1, wherein said discontinuities comprise a periodic arrangement of semiconductor regions.